However, such detection of the interferer discontinuity locations may not be used, particularly as the impact on performance of having an interferer boundary within a block can be minimized by choosing small subfields so that any poor performance of a specific individual subfield may be minimized. Alternatively, if an interferer boundary is detected, the definition of the subfields at block **1015** may be altered so that a subfield boundary is aligned with the interferer boundary to further minimize any associated loss or performance. Thus, as illustrated by the slot grouping **1025** and the associated designation of conventional demodulation (CD) or joint demodulation (JD), the selected intervals (subfields) for the different modulation types may include a plurality of known/pilot field symbols interspersed among other unknown symbols. As shown at slot **1025** of **Figure 10**, three pilot (known) sequences are included in each subfield and then each subfield has a selected demodulation type, shown as conventional demodulation (CD) for the first subfield in slot **1025** and joint demodulation (JD) for the other subfields.

Referring now to the flowchart illustration of **Figure 11**, further embodiments of the present invention utilizing multi-pass demodulation will be described. Operations begin at block **1100** with receipt of a signal to provide a sequence of signals associated with the received signal in respective ones of a plurality of symbol positions. The received sequence of symbols is first pass demodulated and decoded to provide error corrected decoded bits (block **1105**). The error corrected decoded bits are reencoded and modulated to provide a second sequence of symbols associated with the received signal in respective ones of the plurality of symbol positions (block **1110**). The second sequence of symbols includes known symbol values based on the first pass demodulating and decoding operations at block **1105**.

The sequence of symbols is partitioned into a plurality of subfields with ones of the subfields including a plurality of known symbol values (block **1115**). As described previously with reference to **Figure 10,** the subfield partitioning is selected so as to include a plurality of known symbol values selected to be sufficient to allow determination of a desired demodulation type for use in demodulating the subfields based on the known symbol values included in the subfield. The desired demodulation type for use in demodulating the respective subfields is then determined based on the plurality of known symbol values contained in respective ones of the subfields (block **1120**). The subfields are then second pass demodulated using the

respective determined demodulation types for the subfields (block **1125**). Alternatively, an interferer signal characteristic discontinuity location within a subfield may be detected and a first desired demodulation type may be used for a first portion of one of the subfields and a second desired demodulation type may be used for a second portion of the subfield with the first portion and the second portion being demarcated by the interferer signal characteristic discontinuity location within the subfield.

As described above for various embodiments of the present invention disclosed herein, signal reception according to the present invention may be beneficial in interference limited environments for systems which contain time slots. Examples of such systems include IS-136, Global System for Mobile Communications (GSM) and Enhanced Data Rates for Global Evolution (EDGE). For example, interference cancellation receivers are typically used for IS-136 with interference rejection combining for the uplink and joint demodulation proposed for use in the downlink. The methods and systems of the present invention may be beneficially applied to both uplink and downlink communications in such an environment. Note that, while detection and estimation of interferer quantities has been generally discussed herein, the present invention is not limited to any particular method of estimating interferer quantities for use in joint demodulation. Methods to estimate a residual signal (noise and interference) power after conventional equalization are described, for example, in United States Patent Application No. 09/814,889 entitled "Communication System and Method for Measuring Short-Term and Long-Term Channel Characteristics." Further approaches to detecting quantities related to an interferer are described in United States Patent Application No. 09/747,344 entitled "Improving Channel Estimation via Joint Demodulation via Known Field Location" which is related to estimating the location of fixed fields using detected interferer bits and in United States Patent Application No. 09/464,830 filed December 17, 1999 and entitled "Selective Joint Demodulation Systems and Methods for Receiving a Signal in the Presence of Noise and Interference" which seeks to find interferer sync positions through correlation, the entirety of which disclosures is incorporated herein by reference as if set forth in their entirety.

The flowcharts of **Figures 6-11** show the architecture, functionality, and operation of exemplary embodiments of methods, communication apparatus, and

computer program products for processing a received signal. In this regard, each block may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some embodiments, the functions noted in the blocks may occur out of the order noted in **Figures 6-11**. For example, two blocks shown in succession in **Figures 6-11** may be executed substantially concurrently or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved.

It should be noted that many variations and modifications can be made to the preferred embodiments described above without substantially departing from the principles of the present invention. All such variations and modifications are intended to be included herein within the scope of the present invention, as set forth in the following claims.